JOINT TECHNICAL AIRWORTHINESS AUTHORITY - OPERATIONAL AIRWORTHINESS AUTHORITY ADVISORY (TAA-OAA ADVISORY)	
Title	Joint TAA-OAA Advisory on the Authorized Use of Synthetic Aviation Turbine Fuels on DND/CAF Aircraft
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1. Purpose

1.1 This joint Technical Airworthiness Authority (TAA)-Operational Airworthiness Authority (OAA) Advisory provides guidance regarding the acceptability of Synthetic Aviation Turbine Fuels (SATF) for use on Department of National Defence (DND)/Canadian Armed Forces (CAF) aircraft and engines.

2. Applicability

2.1 This TAA-OAA Advisory is applicable to all DND/CAF-registered and leased fixed-wing aircraft, rotary-wing aircraft, and Uncrewed Aircraft Systems (UAS).

2.2 This advisory establishes the baseline against which the TAA and the OAA validate certification in the Type Certificate Data Sheet (TCDS), an Approved Flight Manual (AFM) and/or the Aircraft Operating Instructions (AOI) for DND/CAF Aircraft. The information contained herein shall be read in conjunction with the AFM and/or AOI for each fleet. Where a conflict exists between this advisory and an AFM/AOI, the AFM/AOI shall take precedence.

2.3 The information provided in this advisory supplements the guidance provided in the Airworthiness Design Standards Manual (ADSM) (regulatory reference 3.2.1.b) on the TAA-acceptable use of fuel on DND/CAF aircraft, and it is based on the TAA assessment of the technical information (reference 3.2.2.a) and guidance available from other agencies and aircraft/engine Original Equipment Manufacturers (OEMs) deemed acceptable by the TAA and the OAA.

3. Related Material

3.1 Definitions

NOTE:

Some of the definitions provided in this advisory, also defined in the Technical Airworthiness Manual (TAM) (regulatory reference 3.2.1.a), are not meant to repeat the TAM Glossary definitions, but rather to provide additional details for a better understanding of these terms in the context of this advisory.

a. **Aeronautical Product.** Any aircraft, aircraft engine, aircraft propeller, aircraft appliance or the component parts of any of those things including computer systems and software.

b. **Aircraft.** Any Machine capable of deriving support in the atmosphere from reactions of the air.

c. **Approved Flight Manual (AFM).** The Flight Manual (FM), once Airworthiness Approval has been granted by the TAA and the OAA.

d. **Aircraft Operating Instructions (AOI).** The AOI is the operating manual provided by the aircraft operator to aircrew. It is normally issued and approved by the OAA. In general, the AOI should complement the FM by providing aircraft and mission system information that is not included in the basic FM. The TAA provides no oversight of the AOI, so any TAWD reproduced in the AOI must be consistent with that appearing in the FM.

e. **Flight Manual (FM).** A technical document, normally provided by the OEM, which contains the Technical Airworthiness Data (TAWD). A typical Flight Manual would contain operating limitations, Normal/Abnormal/Emergency operating procedures, performance data and loading information. It is submitted to the TAA and the OAA for airworthiness approval as part of the Type Certification process.

NOTES:

1. *The term AFM applies equally to fixed-wing aircraft and rotorcraft.*
2. *For fleets that do not have an AFM, those sections of the AOI that contain TAA-approved Technical Airworthiness Data (TAWD) can be assumed to be the equivalent of the AFM.*

f. **Jet A.** Primary commercial aviation fuel in continental U.S., as defined in the American Society for Testing and Materials (ASTM) Standard Specification D1655-22A (reference 3.2.2.b).

g. **Jet A-1.** Primary global commercial aviation fuel, as defined in ASTM D1655-22A (reference 3.2.2.b).

h. **Sustainable Aviation Fuel (SAF).** A subset of Synthetic Aviation Turbine Fuel (SATF) distinguished as aviation fuel that has been developed from non-conventional hydrocarbon sources and, as a result, has less net lifecycle carbon emissions than conventionally-produced fuel (reference 3.2.2 a).

i. **Synthetic Aviation Turbine Fuel (SATF).** Aviation fuel that is comprised of non-conventional hydrocarbon sources (reference 3.2.2 a).

j. **Technical Airworthiness Data (TAWD).** The information and data contained in the Type Record that is required to safely operate the aircraft throughout its approved envelope.

3.2 References

3.2.1 Regulatory References:

a. C-05-005-001/AG-001 – Technical Airworthiness Manual (TAM)

b. C-05-005-001/AG-002 – Airworthiness Design Standards Manuals (ADSM), Part 2, Chapter 12 – Fuels, Lubricants and Hydraulic Fluids

3.2.2 Non-Regulatory References:

a. DTAES Technical Note 77-20-03 – Confirmation of ASTM D7566 Synthetic Aviation Turbine Fuel Acceptance for RCAF Aircraft Operations (available internally, within DND, under AEPM RDIMS library #1993312)

b. ASTM D1655-22A – Standard Specification for Aviation Turbine Fuels, 14 Nov 2022

c. ASTM D7566 – Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons

d. ASTM D4054 – Standard Practice for Qualification and Approval of New Aviation Turbine Fuels and Fuel Additives

4. Discussion

4.1 Background

4.1.1 The approved type design for each aeronautical product has airworthiness and design operating limitations within which the aeronautical product is required to operate to ensure its continuing airworthiness during in-service usage. These design operating limitations include approved fuel

types. They are documented in the Type Certificate Data Sheet (TCDS) attached to the type certificate of the aeronautical product, as part of the certification basis (reference 3.2.1.a).

4.1.2 The certifying authority does not directly regulate fuel standards. Instead, it participates in the industry-led specification change and approval process for fuels. Identification of approved fuel types is primarily based on ASTM International fuel standards. Over the years, airworthiness regulatory bodies, fuel standard bodies and engine and aircraft manufacturers have worked through ASTM International to recognize ASTM D1655 as the primary reference specification for commercial aviation, which defines Jet A and Jet A-1 as the primary commercial aviation fuel. Although developed initially for civil applications, ASTM D1655 has also been adopted for military aircraft.

4.1.3 The certification process for DND/CAF aeronautical products uses the same methodology to identify approved fuel types. Military Fuel Specifications state that ASTM D1655-defined commercial fuel with a military additive package is equivalent to the respective military fuel designation.

4.1.4 The ASTM D7566 specification identifies currently acceptable SATF production pathways that are designed to meet the requirements of ASTM D1655, and are proven to do so by ASTM D4054. As a result, ASTM D7566 fuels are redesignated as ASTM D1655-compliant fuels without distinction from conventionally-produced fuel, and can be included into the existing fuel supply without providing any additional identification or notification to operators.

4.1.5 The TAA-OAA acceptance of SATF reinforces the Canadian Military Airworthiness Authority's efforts to comply with interoperability requirements among NATO participating countries. No additional certification effort is required for operation with SATF as a result of this acceptance. WSM and OA fleet staffs concur with the current assessment and process moving forward, and will continue to monitor and advise of any future concerns.

4.1.6 SATF is currently available commercially and can be present in existing civilian fuel supply systems. On a global scale, aircraft have already been operating with the alternatively developed fuel.

4.2 TAA-OAA Guidance

4.2.1 SATF that is produced to the ASTM D7566 specification is designed to meet the ASTM D1655 specification for Jet A and Jet A-1 fuels, the primary commercial aviation fuel and its military equivalent derivatives.

4.2.2 Since ASTM D7566 fuels are redesignated as ASTM D1655 fuels without distinction from conventionally-produced fuel, and all DND/CAF-operated aircraft are certified to use ASTM D1655 fuels, the TAA and the OAA have jointly deemed SATF acceptable for use on DND/CAF-operated aircraft, without any technical or operational risk for the aircraft and its occupants.

4.2.3 The TAA (DTAES 7-7 staff) can provide specialist advice regarding the standards referred in this joint advisory and the joint TAA-OAA acceptability of SATF into the DND supply system.

4.2.4 RCAF operators are to continue to use all ASTM D1655 standard fuels with confidence regardless of the source or production method.